

Appl. No. 10/698,988  
Amdt. Dated April 27, 2005

Attorney Docket No.: NSL-014  
Reply to Office Action of Feb. 8, 2005  
Supplement to Amendment of Apr. 11, 2005

**REMARKS:****AMENDMENTS TO THE CLAIMS**

To expedite prosecution, the Applicants have amended claim 12 to recite that the layers of organic material are layers of polymer material. Support for this feature can be found in the specification at page 3, line 12. The applicants submit that no new matter has been entered with this amendment. The applicants have made minor amendments to claims 13, 18 and 20 that improve readability of these claims by making the language consistent with that of claim 12. Furthermore, the applicants submit that this amendment does not narrow the scope of any limitation of any claim. Indeed, the amendment broadens the scope of claim 12 and claims that depend from claim 12. New claim 27 has been added to recite the specific polymer materials formerly recited in claim 12. The applicant submits that the claims, as amended are allowable over the prior art for the reasons set forth in the amendment submitted on April 11, 2005. Out of an abundance of caution, the applicant submits essentially the same arguments in slightly modified form as set forth below.

**CLAIM REJECTIONS****35 USC 102**

Claims 12-15, 20-21 and 23-24 were rejected under 35 USC 102(b) as being anticipated by PCT Publication WO00/78540 to Singh et al. (hereinafter Singh). In rejecting the claims the Examiner states that Singh teaches a laminate film comprising layers of nanocomposite, layered silicates dispersed in a polymer material and that the polymer material is polystyrene or polyvinylchloride. The Examiner concludes that Singh discloses a nanolaminate film in which layers of organic material alternate with layers of inorganic material. The Applicant respectfully traverses the rejection.

Claim 12 has been amended to recite that adjacent layers of the organic polymer and inorganic materials are covalently bonded to each other. Please note that in claim 12, the organic material layers are identified as being polymers. Singh is devoid of any teaching or suggestion of layers of inorganic material covalently bonded to polymer layers as set forth in claim 12. Instead Singh teaches that a compatibilizing agent may be covalently bonded to the layered silicates (see page 11, line 30 to page 12, line 10). Singh does not teach that the compatibilizing agent is the matrix polymer or that the compatibilizing agent is covalently bonded to the *polymer material*. Instead Singh specifically teaches at page 31, lines 8-21:



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By the term "compatibilizing agent" or related phrase is meant a preferred organophilic agent that is capable of being covalently linked to the inorganic layered silicate and which facilitates effective intercalation or exfoliation in that silicate. A particular agent is "compatible" to the extent that it facilitates favorable interactions between the platelet particles and the matrix polymer material. Without wishing to be bound to theory, especially preferred compatibilizing agents in accord with this invention are believed to provide for at least one of the following desirable matrix properties: similar cohesive energy densities for the polymer material and the derivatized platelets, similar or complimentary capacities for dispersive, polar, or hydrogen bonding interactions, or other specific interactions, such as acid/base or Lewis-acid/Lewis-base interactions. Additionally, good compatibilization helps to improve contact and particularly dispersion of the platelet particles in the matrix and an improved percentage of delaminated platelets with a thickness of less than about 50 Angstrom.

In short, Singh teaches that the compatibilizing agent is different from the matrix polymer and that the compatibilizing agent renders the surface of the silicates organophilic. This facilitates "intercalating", "exfoliating" or incorporation of the layered silicates into a matrix polymer.

Entirely absent from Singh's discussion of compatibilizing agents is any teaching or suggestion that the compatibilizing agent covalently bond with or be capable of covalently bonding with the matrix polymer. Instead, Singh specifically teaches that the contact between the polymer and compatibilized silicates is through an ion exchange interaction (see p. 45, lines 25-27 and page 47 lines 4-22). Thus Singh does not teach and, in fact, teaches away from covalently bonding the layered silicates to the matrix polymer. Therefore, the applicants submit that Singh does not teach all the features of claim 12 and a prima facie case of anticipation is not present.

Furthermore, it is submitted that Singh does not anticipate claims 13, 14, 20, 21, and 23-26 by virtue of their dependence from claim 12.

35 USC 103

Claims 16-17 were rejected under 35 USC 103(a) as being obvious over Singh. In addition, claim 15 was rejected as being obvious over Singh in further view of US Patent 6,818,163 to Fibiger et al. (hereinafter Fibiger). Also, claims 18-19 were rejected as being obvious over Singh in view of US Patent 5,372,888 to Ogawa (hereinafter Ogawa). Furthermore, claim 22 was rejected as being obvious over Singh in further view of US Patent 6,264,741 to Brinker et al. (hereinafter Brinker). The applicants respectfully traverse the rejections.

For the reasons set forth above, the applicants submit that Singh does not teach all the features of claim 12. The Examiner has pointed to no teaching in Fibiger, Ogawa or Brinker, either alone or in combination with Singh tending to teach or suggest all the features of claim 12. As such, no



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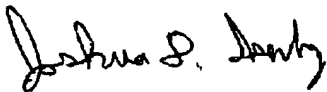
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combination of Singh with Fibiger, Ogawa, Brinker or skill in the art teaches or suggests all the features of claim 12 and a prima facie case of obviousness is not present. Furthermore claims 15-19 and 22 all depend from claim 12 and recite additional features therefor. As such, and for the same reasons set forth above the applicants submit that these dependent claims define an invention suitable for patent protection.

#### CONCLUSION

For the reasons set forth above, the Applicants submit that all claims are allowable over the cited art and define an invention suitable for patent protection. The Applicants therefore respectfully request that the Examiner enter the amendment, reconsider the application, and issue a Notice of Allowance in the next Office Action.

Respectfully submitted,



Joshua D. Isenberg  
Reg. No. 41,088  
Patent Attorney

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JDI PATENT  
204 Castro Lane  
Fremont, CA 94539  
tel.: (510) 896-8328  
fax.: (510) 360-9656